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10/022,826	12/20/2001	Sung-hee Hwang	1293.1215	1431

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STAAS & HALSEY LLP  
SUITE 700  
1201 NEW YORK AVENUE, N.W.  
WASHINGTON, DC 20005

EXAMINER

TORRES, JOSEPH D

ART UNIT	PAPER NUMBER
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2133

DATE MAILED: 11/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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## Office Action Summary

**Application No.**

10/022,826

**Applicant(s)**

HWANG ET AL.

**Examiner**

Joseph D. Torres

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 30 August 2004.  
2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-47 is/are pending in the application.  
4a) Of the above claim(s) 46 and 47 is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1-45 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☒ The drawing(s) filed on 20 December 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☒ All b) ☐ Some \* c) ☐ None of:  
1. ☒ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Election/Restrictions***

1. Applicant's election with traverse of Group I in the reply filed on 08/06/2004 is acknowledged. The traversal is on the ground(s) that "many patents have issued which are directed to both recording and reproducing" and "The Examiner has not set forth why there would be a serious burden". This is not found persuasive because 1. the issuance of patents is based on the prosecution history and without the details of the record, it is impossible to determine the relevance to the current application, and 2. there are 1233 documents in the relevant class/subclasses (714/763,769,770.ccls.), 5339 documents that include the language "(interleave interleaving interleaved interleaves interleaver) and reproducing" and 12,726 that include the language "(interleave interleaving interleaved interleaves interleaver) and recording" (Note: 9769 of those documents use reproducing and recording mutually exclusively). The Examiner asserts that searching both groups would create a serious burden for the Examiner.

The requirement is still deemed proper and is therefore made FINAL.

### ***Information Disclosure Statement***

2. The information disclosure statement filed 08/30/2004 fails to comply with the provisions of 37 CFR 1.97, 1.98 and MPEP § 609 because no English translation was provided for one of the documents. It has been placed in the application file, but the

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information referred to therein has not been considered as to the merits. Applicant is advised that the date of any re-submission of any item of information contained in this information disclosure statement or the submission of any missing element(s) will be the date of submission for purposes of determining compliance with the requirements based on the time of filing the statement, including all certification requirements for statements under 37 CFR 1.97(e). See MPEP § 609 ¶ C(1).

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 30 and 31 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention. Claims 30 and 31 together comprise a single means claim since the only functional limitation in the claims is the single limitation in claim 31. See MPEP § 2164.08(a).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 1-45 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01. The omitted elements are: Claim 1 recites, a “method of recording data on an optical disc”, but nowhere in the body of the claim does the Applicant indicate how the limitations of claim 1 are linked to recording data on an optical disk. Independent claims 9 and 32 have the same problem. Claims 19 and 24 recite an “apparatus to record data on an optical disc”, but nowhere in the body of the claim does the Applicant indicate how the limitations of claim 1 are linked to recording data on an optical disk.

Claims 1-8 and 32-41 is rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between “each of a plurality of error correction code (ECC) blocks” and “a plurality of partitions”. Claim 32 recites similar language as in claim 1, hence suffers from the same problems as in claim 1.

In addition, claim 1 recites a “method of recording data on an optical disc”; correcting a burst error as claimed in claim 41 is not part of a “method of recording data on an optical disc”.

Claims 1-18 and 32-45 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 1 recites, "alternately and equally selected". It is unclear what "alternately and equally" refers to. It is unclear what the structural relationship between "alternately and equally selected" and "ECC blocks" is. See MPEP § 2172.01. Note: alternately only makes sense if there are exactly two ECC blocks as in claim 9; otherwise claim language must be incorporated into claims 1 and 32 to define what is meant by alternately selected. On the other hand, it is unclear what equally selected (in claims 1 and 9) refers to and language must be incorporated into the claim to define what is meant.

Claims 3 and 11 recite, "the first recording block is rearranged on a sector basis". It is unclear what relationship a sector has with "each of a plurality of error correction code (ECC) blocks" and "a plurality of partitions". See MPEP § 2172.01.

In claims 8, 16-18, 23, 27-29, 38 and 39; N1, N2 and d are undefined. Furthermore, "N2/d object blocks" makes no sense, for example; if N2=3 and d=2.

In claim 45; k2 is undefined. Furthermore, "2 x k2/32 rows" makes no sense, for example; if k2=1.

Claims 19-23 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 19 recites, "a data extracting portion to alternately extract data". It is unclear what the structural relationship between "a data extracting portion to alternately extract data" and "ECC blocks" is. See MPEP § 2172.01. Note:

alternately only makes sense if there are exactly two ECC blocks; otherwise claim language must be incorporated into the claim to define what is meant by alternately selected.

Claims 19-29 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between “a plurality of partitions” and “each of the ECC blocks” divided “into a first unit in a row direction and a second unit in a column direction”.

Claims 30 and 31 are rejected under 35 U.S.C. 112, second paragraph, as being incomplete for omitting essential structural cooperative relationships of elements, such omission amounting to a gap between the necessary structural connections. See MPEP § 2172.01. The omitted structural cooperative relationships are: the relationship between “partitions” and “a plurality of error correction code (ECC) blocks”.

### ***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 1-45 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter. The limitations in independent claims 1, 9, 19, 24, 30 and 32 are conceptual in nature for generating a particular data structure (Note: the limitations in claim 1 can be interpreted as a conceptual data structure for understanding not tied to an actual apparatus) and are not tied to a concrete apparatus. Data structures are non-statutory. Methods that can be implemented in software or by hand are non-statutory.

In particular, claims 30 and 31 are directed strictly to a non-statutory data structure.

### ***Claim Rejections - 35 USC § 102***

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

6. Claims 1-45 are rejected under 35 U.S.C. 102(e) as being anticipated by Noda; Chosaku (US 6216245 B1).

35 U.S.C. 102(e) rejection of claims 1 and 41.

Noda teaches dividing each of a plurality of error correction code (ECC) blocks into a plurality of partitions (Figure 5 in Noda teaches dividing each of a plurality of error correction code (ECC) blocks into 16 sector partitions); and interleaving the data from the partitions so that each of the ECC blocks is alternately and equally selected to generate a first recording block (Figure 8 in Noda teaches interleaving the data from the



sector partitions so that each of the ECC blocks is delayed and alternately and equally selected to generate first recording blocks depicted in the rows of Figure 9 in Noda).

35 U.S.C. 102(e) rejection of claims 2 and 3.

Figure 6 in Noda teaches that the last 16 rows of outer code parity in Figure 5 are rearranged so that the rows are interleaved into the 13<sup>th</sup> row of each sector.

35 U.S.C. 102(e) rejection of claim 4.

Modulation Section 4 in Figure 3 of Noda is a means for modulating the first recording block; and recording the modulated first recording block on the optical disc.

35 U.S.C. 102(e) rejection of claim 5.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 6.

All of the data is interleaved using the algorithm of Figures 8 and 9 in Noda.

35 U.S.C. 102(e) rejection of claim 7.

Figures 8 and 9 in Noda teach a predetermined number of bytes of the data are extracted and rearranged to generate the first recording block.

35 U.S.C. 102(e) rejection of claim 8.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 9.

Noda teaches dividing each of two error correction code (ECC) blocks in row and column directions to generate a plurality of partitions (col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block); and generating a first recording block, the generating comprising interleaving the data from the partitions so that each of the ECC blocks is alternately and equally selected.

35 U.S.C. 102(e) rejection of claims 10 and 11.

Figure 6 in Noda teaches that the last 16 rows of outer code parity in Figure 5 are rearranged so that the rows are interleaved into the 13<sup>th</sup> row of each sector.

35 U.S.C. 102(e) rejection of claim 12.

Modulation Section 4 in Figure 3 of Noda is a means for modulating the first recording block; and recording the modulated first recording block on the optical disc.

35 U.S.C. 102(e) rejection of claim 13.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 14.

All of the data is interleaved using the algorithm of Figures 8 and 9 in Noda.

35 U.S.C. 102(e) rejection of claim 15.

Figures 8 and 9 in Noda teach a predetermined number of bytes of the data are extracted and rearranged to generate the first recording block.

35 U.S.C. 102(e) rejection of claim 16-18.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 19.

Noda teaches an error correction code (ECC) encoder to generate a plurality of ECC blocks on which the data is recorded (see Error Correction Encoder 3 in Figure 3 of Noda); and an interleaver (see Figure 7 in Noda), comprising: a partitioning portion to divide each of the ECC blocks into a first unit in a row direction and a second unit in a column direction to generate a plurality of partitions (col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block), a data extracting portion to alternately extract data from the partitions, and a recording block generating portion to interleave the extracted data and generate a recording block (Figure 5 in Noda teaches dividing each of a plurality of error correction code (ECC) blocks into 16 sector partitions; Figure 8 in Noda teaches interleaving the data from the sector partitions so that each of the ECC blocks is delayed and alternately and equally selected to generate first recording blocks depicted in the rows of Figure 9 in Noda).

35 U.S.C. 102(e) rejection of claim 20.

Modulation Section 4 in Figure 3 of Noda is a means for modulating the first recording block; and recording the modulated first recording block on the optical disc.

35 U.S.C. 102(e) rejection of claim 21.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 22.

Noda teaches the recording block generating portion sequentially interleaves the extracted data to generate the recording block (Note Figure 8 teaches interleaving sequentially row by row).

35 U.S.C. 102(e) rejection of claim 23.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined

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number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 24.

Noda teaches an error correction code (ECC) encoder to generate a plurality of ECC blocks on which the data is recorded (see Error Correction Encoder 3 in Figure 3 of Noda); and an interleaver (see Figure 7 in Noda), comprising: a partitioning portion to divide each of the ECC blocks into a first unit in a row direction and a second unit in a column direction to generate a plurality of partitions (col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block), a data extracting portion to alternately extract data from the partitions, and a recording block generating portion to interleave the extracted data and generate a recording block (Figure 5 in Noda teaches dividing each of a plurality of error correction code (ECC) blocks into 16 sector partitions; Figure 8 in Noda teaches interleaving the data from the sector partitions so that each of the ECC blocks is delayed and alternately and equally selected to generate first recording blocks depicted in the rows of Figure 9 in Noda).

35 U.S.C. 102(e) rejection of claim 25.

Modulation Section 4 in Figure 3 of Noda is a means for modulating the first recording block; and recording the modulated first recording block on the optical disc.

35 U.S.C. 102(e) rejection of claim 26.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claims 27-29.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claims 30-33.

Noda teaches dividing each of a plurality of error correction code (ECC) blocks into a plurality of partitions (Figure 5 in Noda teaches dividing each of a plurality of error correction code (ECC) blocks into 16 sector partitions); and interleaving the data from the partitions so that each of the ECC blocks is alternately and equally selected to

generate a first recording block (Figure 8 in Noda teaches interleaving the data from the sector partitions so that each of the ECC blocks is delayed and alternately and equally selected to generate first recording blocks depicted in the rows of Figure 9 in Noda).

35 U.S.C. 102(e) rejection of claim 34.

See Error Correction Encoder 3 in Figure 3 of Noda.

35 U.S.C. 102(e) rejection of claim 35.

See Figure 7 in Noda.

35 U.S.C. 102(e) rejection of claims 36 and 37.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claims 38 and 39.

Col. 1, lines 49-55 in Noda teach dividing each of the ECC blocks in a column direction by a predetermined number of bytes into object blocks; and dividing each of the object blocks in at least one of a row direction and the column direction by the predetermined



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number of bytes to generate the plurality of partitions for the purposes Reed-Solomon encoding of an ECC block.

35 U.S.C. 102(e) rejection of claim 40.

Modulation Section 4 in Figure 3 of Noda is a means for modulating the first recording block; and recording the modulated first recording block on the optical disc.

35 U.S.C. 102(e) rejection of claim 42.

See Figures 6 and 8.

35 U.S.C. 102(e) rejection of claim 43.

Col. 1, line 44-47 of Noda.

35 U.S.C. 102(e) rejection of claim 44.

See Figures 5 and 6.

35 U.S.C. 102(e) rejection of claim 45.

Figure 6 in Noda teaches that the last 16 rows of outer code parity in Figure 5 are rearranged so that the rows are interleaved into the 13<sup>th</sup> row of each sector.

***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Michigami; Toru et al. (US 6223322 B1) teaches methods and apparatus for processing product (rectangular) error correction-coded (ECC) data arrays, and more particularly to increasing the effective data rate as data is moved among memory and correction circuitry. Jeong; Jong-sik et al. (US 6539512 B1) teaches an interleaving method and circuit which can be applied to a high density recording medium having a high definition digital versatile disc (HD-DVD) format and by which high-speed searching can be achieved. Kojima; Tadashi (US 6718510 B2) teaches a recording medium for an error-correcting product code favorable for use in the recording and transmission of digital data.

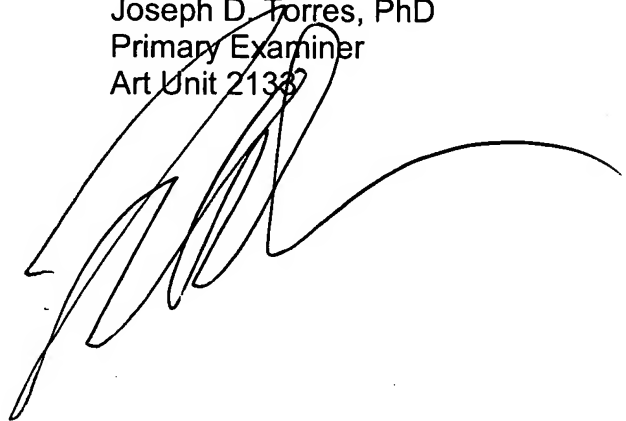
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joseph D. Torres whose telephone number is (571) 272-3829. The examiner can normally be reached on M-F 8-5.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Albert Decady can be reached on (571) 272-3819. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Joseph D. Torres, PhD  
Primary Examiner  
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A handwritten signature in black ink, appearing to read 'J. D. Torres', is written over the printed name and title of the Primary Examiner.